

**NORTH AMERICAN  
COUNTERPARTS OF *SIGESBECKIA*<sup>1</sup>  
*ORIENTALIS* (COMPOSITAE)**

**by**

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<sup>1</sup>Spelled *Siegesbeckia* by almost all authors. Linnaeus consistently used the spelling *Sigesbeckia*, although he had originally named the genus in honor of J. G. Siegesbeck. The shorter spelling evidently is the correct one.

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Bentham (Benth. & Hook. Gen. Pl. 2, pt. 1: 359. 1873) regarded *Siegesbeckia* [sic] as a genus of two species, one (*S. orientalis* L.) widely distributed in the tropics and subtropics of both Old and New Worlds, the other (*S. flosculosa* L'Her.) a native of Peru. According to this concept, *S. orientalis* included not only all the populations from the Old World, but also several New World populations that had been proposed as independent species by other authors. Since Bentham's time the proper disposition of these American plants has been a matter of question. North American specimens have generally been referred to *S. orientalis* or to *S. jorullensis* HBK., South American specimens to *S. orientalis*, *S. cordifolius* HBK., or *S. agrestis* Poepp. & Endl.

After study of many herbarium specimens from North America, and a selection of the available material from South America and from the Old World, we conclude 1) that *S. orientalis* L., sensu lato, is restricted to the Old World as a native plant, although introduced at a few localities in the American tropics; 2) that regional populations of *S. orientalis* exist and are readily recognizable by gross morphological features; 3) that most of the New World *Siegesbeckias* that have been called *S. orientalis* (both North and South American) represent a single species (*S. jorullensis* HBK.), this mostly in humid mountain ranges at elevations above 2500 m, from western Mexico to Chile; and 4) a second species (*S. agrestis* Poepp. & Endl.), previously confused with *S. jorullensis*, ranges from western Mexico to Amazonian Peru, occupying a somewhat drier, warmer habitat than that of *S. jorullensis*, mostly at elevations less than 2000 m.

We have examined most of the specimens from the herbarium of the Field Museum (F), the Harvard University herbarium (GH), the New York Botanical Garden (NY), the University of Michigan (MICH), the University of Texas (TEX), and the United States National Herbarium (US), and we wish to express our thanks to those in charge of these herbaria. We were able to study the type of *S. agrestis*, and selected other specimens from the Naturhistorisches Museum, Vienna (W), through the kindness of Prof. K. H. Rechinger. Dr. Alicia Lourteig, of the Muséum National d'Histoire Naturelle, Paris (P), very helpfully verified our tentative conclusions as to the identities of the types of *S. jorullensis* and *S. cordifolia*. Publication of this contribution was supported by the National Science Foundation (Grant GB-5218X, to McVaugh).

In the American tropics there are several small helianthoid genera, including *Siegesbeckia*, that are alike in a number of distinctive features, enough to suggest that they may be closely related. They are normally opposite-leaved, with a tendency to the production of stipitate glands at least in the inflorescence; the achenes are epappose; the achenes of the ray florets are equal in number to, and closely subtended by, the thin inner phyllaries; there is an outer series of phyllaries, usually 5 in number, that are more or less foliaceous and often spreading, morphologically unlike the inner series. The species of *Siegesbeckia* discussed below, for example, are so similar to Mexican species of *Trigonospermum* that the two are often confused; the two genera are distinguished on the basis of the disk flowers, which are fertile in *Siegesbeckia*, sterile in *Trigonospermum*. *Rumfordia* seems to differ from *Siegesbeckia* chiefly in having larger heads and broader phyllaries, and *Polymnia* differs from *Trigonospermum* in much the same way. It may be premature to speculate further upon this, but it does seem that Bentham's disposition of these four genera on the basis of a single character may have been too artificial; in his system *Trigonospermum* and *Polymnia* (with disk flowers sterile) were assigned to subtribe Melampodieae, whereas *Rumfordia* and *Siegesbeckia* were placed in subtribe Verbesineae.

The following key provides a contrast between *Siegesbeckia orientalis*, sens. lat., and the North American species that have been confused with it. The latter are both



tall, much-branched annuals or short-lived perennials with very narrow outer phyllaries. The other known American species include *S. flosculosa* L'Her., a South American species unique in having very short rays and triandrous disk-flowers; and two short-stemmed or subacaulescent perennial North American species with fewer, larger heads and relatively broader phyllaries, viz. *S. repens* Rob. & Greenm., and *S. nudicaulis* Standl. & Steyererm.

1. Petioles long-tapering to the base, not prominently amplexicaul nor auriculate-winged at base; leaves resinous-dotted beneath, coarsely toothed, the blades often sub-hastately toothed or sub-lobulate, the lower teeth often much enlarged; outer phyllaries copiously pilose on the outer (abaxial) surface with eglandular hairs, coarsely stipitate-glandular on the inner surface (the glandular hairs very stout, 0.5 mm long); achenes 3–3.5 mm long.  
*S. orientalis.*
1. Petioles broadly winged or, if long-tapering to the base, finally expanded and auriculate or subamplexicaul; leaves serrate or serrulate, the lower teeth rarely much larger than the upper ones; outer phyllaries glabrous on the abaxial surface or with a few stipitate glands, if with a few eglandular hairs then finely stipitate-glandular (the glandular hairs hardly more than 0.1–0.3 mm long); achenes 1.8–2.5 mm long.
2. Leaves without resinous dots beneath; anthers green; narrow outer phyllaries without long simple hairs, but with stipitate glands about 0.5 mm long; receptacle (after the achenes fall) broader than long, less than 1 mm long.  
*S. jorullensis.*
2. Leaves with many resinous dots beneath; anthers yellow; narrow outer phyllaries usually with a few eglandular hairs, and many stipitate glands 0.2–0.3 mm long; receptacle longer than broad, 1–2 mm long.  
*S. agrestis.*

1. ***Sigesbeckia orientalis*** L. Sp. Pl. 900. 1753.

Type locality: "Habitat in China, Media *ad pagos*." Type: The account in the *Species Plantarum* was derived partly from Buxbaum and Plukenet, and partly from the *Hortus Cliffortianus* and the *Hortus Upsaliensis*. As Linnaeus knew the plant from Clifford's garden and from his own garden in Uppsala, the name of the species may be typified by one of his own specimens. The specimen in the Linnaean Herbarium in London (no. 1018–1) labelled "orientalis" in the hand of Linnaeus, may well stand as the type. It is readily identifiable from a photograph, by leaf-characters, as a member of the Old World assemblage that has always been called *Sigesbeckia orientalis*.

The distinctions between Old World and New World material are mostly in matters of degree. The most easily recognized differences are set forth in the key above. Others are as follows: Specimens of *S. orientalis* are in general more uniformly gray-pubescent, the leaves with short appressed hairs, the branchlets and peduncles with soft spreading hairs; the phyllaries are very coarsely stipitate-glandular, the stipes often rigid, curved, and much enlarged at base; the inner phyllaries are usually relatively strongly incurved and infolded, obtuse, 3–5 mm long (as against 2–3 mm long in American material), with many large rigid glands on the backs; achenes often pebbled, with irregular transverse markings in addition to the longitudinal striae; summit of mature achene usually with a definite low collar left at the fall of the corolla (the corresponding scar in American material flat or with barely perceptible ring-like thickening).

To summarize, *S. orientalis* L., sens. lat., consistently differs from the American species with which it has been confused, in having slender petioles not foliaceous at the base, more coarsely and often hastately toothed leaves; more abundant short hairs on the leaves and soft spreading hairs in the inflorescence; larger and more rigid and curved glandular hairs; larger phyllaries, pales, and achenes; more obtuse, rigid and strongly curved and glandular inner phyllaries; more noticeable surface markings on the achenes and more prominent corolla-scars. None of these differences in itself seems very important taxonomically, but in sum they make it clear that the assemblage of populations in the Old World is not to be confused with that in the New World. As taxa are ordinarily delimited in the Compositae, these extremes cannot logically be combined into a single species.



To take up the question of the taxonomy of *Sigesbeckia orientalis* is beyond the scope of this paper. Examination of a relatively small number of specimens suggests that several or many regional intra-specific races can be recognized. Several supposed species occurring in eastern Asia have been segregated in recent years from the inclusive *S. orientalis*.

Although the species was described as a native of Mexico, the name *Siegesbeckia triangularis* Cav. (Ic. 3: 27. pl. 253. 1795) is evidently a synonym of *S. orientalis* and does not apply to an American plant. Cavanilles clearly described and figured the Old World plant; in his description he went so far as to characterize the coarsely and unevenly serrate leaves as "lobed." His specimens were cultivated in the Madrid garden, supposedly from Mexican seed. From about 1790 onward, however, Cavanilles was receiving not only Mexican seeds from the Royal Botanical Expedition to New Spain, but also many samples of seeds from Née and others who had visited the Old World tropics. It is likely that in this instance, as in some others, there was some error involved.

Apparently *Sigesbeckia orientalis* has been introduced to a very limited extent into the United States, and sparingly into tropical America. We have seen the following specimens:

UNITED STATES: ILLINOIS: Menard Co., Athens, *Lansing & Sherff* 41 (F).

"MEXICO": Ex hort. Matrit. (F, probably fragment of type of *S. triangularis*).

PERU: Without locality, ex herb. Sullivant (NY).

BRAZIL: Near Rio de Janeiro, weedy, *Dusén* 72 (F), 230 (NY), *Pereira* 4894 (F). Santa Catarina, *Smith & Reitz* 12279 (NY).

2. ***Sigesbeckia* [*Siegesbeckia*] *agrestis* Poepp. & Endl. Nov. Gen. & Sp. Pl. 3: 45. pl. 256. 1843.**

In forest or on forest-edges, on shaded banks, along trails and streams, sometimes weedy, in cornfields and clearings, western Mexico to Amazonian Peru. On the Pacific slope of Mexico it is fairly common at elevations of from 1000 to 2000 m (up to about 2500 m), mostly in oak-, oak-pine, or sometimes in pine-fir forest, flowering from September to January. It ranges considerably farther west than *S. jorullensis*, which occurs chiefly in more humid forests at higher elevations. In Central and South America *S. agrestis* seems to occupy approximately the same ecological niche as it does in Mexico, except that the associated species may be quite different. Judging from the small number of collections that have been made, *S. agrestis* is comparatively far less abundant in South America than *S. jorullensis*.

Our concept of *S. agrestis* is based on the plate published by Poeppig and Endlicher, Poeppig's No. 1772B at Vienna, and a photograph (Field Mus. neg. 15186) of Poeppig's No. 1771B at Berlin. All these seem unquestionably to represent the same species. No number was cited in the protologue, and the situation is otherwise confused. In the protologue the date of collection is given as February, and the locality as "in cultis Peruviae circum Cuchero." The Vienna specimen that we take to be the type is labelled not "agrestis" but "arvensis," and the pertinent data are "Peruvia subandina pr cultis ad Pampagaio Febr. 1830." Evidently in the course of publication the epithet was changed, and the precise locality of collection suppressed in favor of a more generalized statement. In spite of these discrepancies we see no reason to question the typification of *S. agrestis*.

Another name based on a collection by Poeppig (*Siegesbeckia serrata* DC. in DC. Prodr. 5: 496. 1836) appears to represent one of the populations of the *jorullensis-cordifolia* group. We have not seen the type (*Poeppig diar.* 463, *herb. n.* 55, in herb. DC.), but a photograph (Internat. Doc. Cent. microfiche, Prodromus herbarium No. 923) of the specimen suggests that it belongs with *jorullensis* rather than with *agrestis*.

Erect, single-stemmed annual up to 1–2 m high, often much smaller, the stem up to 6–7 mm in diameter at base, repeatedly forked above the middle with a terminal



nodding long-pedunculate head in each fork, the lateral branches (except near tips of the inflorescence) much surpassing the terminal heads; herbage pilose-hirsute with hyaline multicellular taper-pointed collapsing hairs, these often very many on the middle and lower stem, where up to 3–5 mm long, and on the lower leaf-surface where 2–2.5 mm long; upper leaf-surface with fewer more rigid hairs; upper stems, peduncles, bracts and phyllaries finely stipitate-glandular, the glandular hairs 0.2–0.3 mm long; leaves resinous-dotted beneath; upper cauline leaves narrowest, usually lanceolate, sessile with broad auriculate bases, the lower leaves with ovate blade prolonged into broadly margined, broadly auriculate clasping petiole; blades of the principal leaves 5–12 cm long, 3–8 cm wide, triplinerved, coarsely or very shallowly and sinuately serrate, acuminate, rounded at base and merging gradually into the petiolar base, the latter 0.6–1.0 (–4) cm wide, 1.5–4 cm long; blades occasionally broadly ovate and truncate or subcordate at base; bracteal leaves lanceolate, sessile, those of the upper forks successively smaller; heads small and inconspicuous, about 5 mm high and 7 mm wide, forming a loose panicle, solitary in the forks and at the tips, thus 125 or fewer in a plant forking 6 times; peduncles 5–20 mm long or the central ones 3–4 cm long, all hooked at the apex in age; outer phyllaries 5, often reflexed at maturity, linear-oblongate or spatulate, 3–10 mm long, 1–1.5 mm wide or less, stipitate-glandular on the margins and the adaxial surface and often with long non-glandular hairs as well; inner phyllaries 8 (–13), green or purplish, elliptic-obovate, 2.5–3 mm long, obtusely keeled, each subtending and appressed to a ray-achene, acute, ciliate, glandular on the back; pales obovate, membranous, scarious, like the inner phyllaries but thinner, more obtuse, scarcely glandular, the innermost narrower; ray-florets 5–8 (–13), the tube 0.6–1 mm long with both glandular and eglandular hairs; ligule 2.5–3 mm long, yellow, glandular-dotted, the lobes 0.7–1.1 mm long; disk florets (5–) 8–13 (–34), the tube 0.5–1 mm long, with both glandular and eglandular hairs; throat campanulate, 0.6–1 mm long, glandular-punctate, the lobes 0.5 mm long; anthers yellow, 0.8 mm long, the narrowly triangular appendages 0.3 mm long; style branches 0.5 mm long; achenes nearly black, 1.5–2 mm long, 4-angled and nearly square in cross-section, 0.6–1 mm wide at the truncate apex, with flat circular scar; sides tapering to the narrow substipitate base, slightly convex, lineate and often noticeably ribbed; receptacle conic, about 1 mm high, the central pales often persistent on it.

In exceptionally vigorous forms the outer phyllaries may become foliaceous, up to 9–11 mm long and 2 mm wide. Flower color, if not noted merely as “yellow” is often recorded by collectors as “deep yellow,” “golden,” “orange-yellow,” or “orange.”

MEXICO: SINALOA: Sierra Madre, El Batel, 4000 ft, *Mexia* 469 (US); 6 mi west of El Palmito, 6000 ft, *D. Flyr* 317 (TEX). JALISCO: San Sebastián to Mascota, *Mexia* 1410 p.p. (MICH, mixed with *Jaegeria hirta*); Talpa de Allende, *McVaugh* 20135 (MICH); Sierra de la Campana, *McVaugh* 20065 (MICH); 28 miles west of Ayutla, *Cronquist* 9790 (MICH, NY); above Ahuacapán, *McVaugh & Koelz* 975 (MICH). MICHOACAN: Tancitaro, *Hinton* 15694 (GH, TEX); south of Uruapan, *King & Soderstrom* 4735 (F, TEX); east of Morelia, *King & Soderstrom* 5090 (F); Coalcomán, *Hinton* 12431 (F, MICH, NY, US, W), 12907 (GH, NY, US); Morelia, *Arsène* 3175 (US); Morelia, Cerro Azul, *Arsène* 7334 (US); Morelia, Loma Sta. María, *Arsène* 5861 (NY, US), 5874 (GH, US), 6615 (US), 6985 (US), 8586 (NY); Quiroga, *Ripley & Barneby* 14130 (NY). MEXICO: Temascaltepec, *Hinton* 2718 (GH, NY), 2929 (US), 5256 (GH, US). GUERRERO: Dist. Mina: Pilas, *Hinton* 9868 (GH); Manchón, *Hinton* 11293 (GH); Teotepec, *Hinton* 14805 (GH, NY, US); Petlacala, *Mexia* 9101 (F, GH, NY, US). OAXACA: Reyes [10 mi N E of Cuicatlán], *Nelson* 1715 (US). VERACRUZ: Orizaba, *Botteri* 478 (US), 500 (GH), 865 (GH, US). CHIAPAS: Mt. Pasitar, *Matuda* 747 (MICH, US); Mpio. Tenejapa, *Breedlove* 12551 (F, MICH).

GUATEMALA: ALTA VERAPAZ: *Stuessy* 595 (TEX), *Standley* 71022 (F), 71034 (F), von Tuerckheim [*J. D. Sm.* 387] (GH, US), *II.* 1291 (F, GH, MICH, NY, US, W). CHIMALTENANGO: *J. R. Johnston* 499 (NY), *Standley* 59108 (F), 79927 (F). GUATEMALA: *Standley* 59264 (F, NY). HUEHUETENANGO: *Standley* 82133a (F). SOLOLA: *Steyermark* 47324 (F, GH).

EL SALVADOR: SAN SALVADOR: *M. C. Carlson* 405 (F).

COSTA RICA: Zarcero, *Austin Smith* H33 (F), A619 (F, GH); Hatillo, *F. Solís* 53 (F); bords du Río Torres, *Tonduz [Pitt. & Dur. Pl. Cost. Exs.* 8961] (GH, US); Prov. San José, *Standley* 32576 (US), 42123 (US).



COLOMBIA: ANTIOQUIA: Angelopolis, *R. A. Toro* 915 (NY). CALDAS: Chinchiná, *Cuatrecasas* 23371 (F); Salento, *Pennell et al.* 8743 (NY). CAUCA: Popayán, *S. Yepes A.* 125 (F), *Lehmann* 6083 (F).

PERU: Peruvia subandina, pr cultis ad Pampagaio, *Poeppig* 1772B (W, type). JUNIN: Utcuyacu, *F. Woytkowski* 35367 (F), 37029 (F).

The following collections differ from those cited above in having the phyllaries less glandular than usual, the outer series usually evidently pilose with simple hairs and often markedly reflexed, and the inner series nearly glabrous; the achenes tending to be dimorphic, those of the rays dorsiventrally compressed, 2.5 mm long, those of the disk nearly square, 1.5 mm long. Vegetatively these plants are like those of *S. agrestis* except that the leaves are more sharply serrate than usual:

MEXICO: MICHOACAN: Zitácuaro, *Hinton* 11852 (F, GH, MICH, NY, W). MEXICO: Temascaltepec, *Hinton* 1925 (NY, US), 5310 (GH, NY).

In the mountains of Hispaniola there is a native *Sigesbeckia* that appears to represent an insular population of *S. agrestis*. We have seen few collections, and these in different stages of development:

HAITI: Furcy, 1300 m, *Leonard* 4646, 4652 (both NY); Mornes des Commissaires, 1600 m, *Holdridge* 932 (F, NY). REP. DOMINICANA: Prov. San Juan, *R.A. & E.S. Howard* 9404 (NY); prope Constanza 1190 m in pineto, *von Tuerckheim* 2935 (NY, W).

3. *Sigesbeckia* [*Siegesbeckia*] *zorullensis* HBK. Nov. Gen. & Sp. 4: 284. 1820. *Siegesbeckia* [sic] *cordifolia* HBK. Nov. Gen. & Sp. 4: 283. 1820. *Polymnia odoratissima* Sessé & Moc. Pl. Nov. Hisp. 148. 1890.

A plant chiefly of humid mountain forests at high elevations, ranging from Mexico through Central American to the Andes. In Mexico it is found often in fir (*Abies*) forest, or in pine-fir, pine-*Cupressus* or *Cupressus* forests, often in dense shade, sometimes a weed of roadsides or clearings, mostly at elevations of from 2500 to 3500 m but occasionally as low as 1300–1500 m. It is little known in western Mexico, but is more common in the high mountains from Mexico City eastward and southeastward through Central America. The habitat in South America is variously described by collectors as "forest," "moist forest," "bushy slopes" or "open places"; apparently many collections from the Andes represent weeds of cultivation or ruderals.

The North American representative of this species-complex is described below. It does not appear to be especially variable. Essentially indistinguishable populations occur in many localities along the Andes from Colombia and Venezuela to Argentina and Chile, within approximately the same altitudinal limits as the North American plant, and it seems reasonable to regard the North and South American populations as conspecific. We should include among these *Sigesbeckia cordifolia* HBK., of which the type came from near Bogotá, Colombia. It was distinguished from *S. zorullensis* chiefly by having more numerous ("16–20") disk flowers. We do not consider this in itself sufficient to justify the separation of two species. It is true that among the South American material specimens with numerous disk flowers occur more often than among the North American, and doubtless this is of taxonomic significance. Full consideration of this is not possible at this time, and we have therefore treated the South American taxa cursorily, merely suggesting that most of them are probably not specifically different from *S. zorullensis*. There appears to be considerably more variation, both vegetative and in characters of flowers and fruit, among South American populations than in North America. Most specimens have the coarsely glandular phyllaries and green anthers of *S. zorullensis*, but there is a diversity of leaf-form, as well as the variation in number of disk-flowers mentioned above. An occasional specimen may have yellow anthers or gland-dotted leaves (as in *S. agrestis*) but otherwise appear typical of the *zorullensis* group. Perhaps these two species hybridize where their ranges approach one another; in any event a more intensive study of the South American plants is needed.



The type-locality of *S. jorullensis* was published as "in monte ignivomo Mexicano, Volcan de Jorullo, alt. 530 hex." It is unlikely that the specimen collected by Humboldt and Bonpland actually came from this low elevation on the Volcán de Jorullo, which was visited by Humboldt and Bonpland just before they returned to Mexico City by way of the Nevado de Toluca. *Sigesbeckia jorullensis* is a plant of high-altitude, humid coniferous forests, and is well known from both the Nevado de Toluca and from the high mountains surrounding the Valley of Mexico. At the time Humboldt and Bonpland visited Jorullo, the volcano was less than 50 years old, having erupted violently in 1759. It is located at the edge of the hot lowlands of the Balsas valley, and even today provides no very suitable habitats for mesophytic or high-altitude species. It is probable that the plants collected by Humboldt and Bonpland during this the latter part of their journey of September, 1803, were hastily labelled and bundled together in such a way in the field that definite localities could not be assigned to them later except from memory.

A fibrous-rooted, single-stemmed, short-lived perennial or perhaps annual herb up to 1 m high or more, the stem up to 6–7 mm thick at base, repeatedly forked at the apex with a terminal, nodding, long-pedunculate flower in each fork, usually with strong ascending lateral branches from the nodes below the lowest fork; lower stems sparingly pilose to hirsute with hyaline multicellular taper-pointed collapsing hairs up to about 2 mm long; cells of the large hairs (or at least 6–10 of the basal cells) short, less than twice as long as wide; leaves with some similar, mostly smaller hairs on the veins beneath and some stiffer hairs above, the lower surface without resinous dots; upper branches, peduncles and involucre stipitate-glandular, the gland-tipped hairs mostly 0.5 mm long or more; leaves strictly opposite, with broad auriculate or subclasping bases, the upper generally lanceolate and sessile, the others with ovate to deltoid or cordate blade and margined petiole; blades of the principal leaves (3–) 5–8 (–12) cm long, 2.5–8 cm wide, triplinerved, coarsely or very shallowly and sinuately serrate, acuminate or especially the lower acute; upper leaves mostly rounded at base to a broad petiole much shorter than the blade; lower leaves often truncate or subcordate, the margins decurrent onto winged petioles 3–6 mm wide, tapering to the expanded base, 2–7 cm long, often 1/2–3/5 as long as the blade; bracteal leaves lanceolate, the upper much reduced; heads (except for the long outer phyllaries) inconspicuous, 3–5 mm high, 5–7 mm wide in fruit, forming a loose irregular panicle, solitary in the forks and at the tips, often 50–100 in all, on slender uncinatate peduncles 1–2 cm long (or the central ones 3–4 cm long); outer phyllaries loosely spreading, 5 (–6), (5–) 8–20 mm long, usually very narrowly linear-spathulate with expanded tip 0.5–1 mm wide, coarsely stipitate-glandular on the margins and adaxially, but without eglandular hairs; inner phyllaries usually 8, 2–3 mm long, green or purplish, glandular, obovate, acuminate, each obtusely keeled and appressed to a ray-achene; pales like the inner phyllaries but narrower, thinner, scarious, greenish and glandular at tips only; ray-florets usually 8, the tube 0.8–1.5 mm long; ligule 1.5–2 mm long, yellow or often drying red-purple, the lobes 0.3–0.7 mm long; disk florets (?8–) 13 (–18), yellow, the tube 0.6–1 mm long, the throat broad, 0.5–0.7 mm long, 0.5 mm wide, the lobes 0.5 mm long; anthers green, about 0.8 mm long including the ovate acute appendages; style-branches 0.5 mm long; achenes nearly black, 2.3–2.7 mm long, obtusely 4-angled and laterally compressed, 1–1.5 mm wide in the broadest dimension at the truncate apex, curved to the narrow tapering base, striate but not ribbed, with flat circular apical scar; receptacle conic, as broad as long.

Specimens examined (MEXICO):

CHIHUAHUA: Mojarachic, *Knobloch* 5413 (F); Arroyo Ancho ["Aucho"], *Pringle* 1283 (F, GH, MICH, NY, US). DURANGO: near El Salto, *McVaugh* 21740 (MICH). JALISCO: Volcán Tequila, 2700 m, *Webster & Breckon* 15917 (MICH). MICHOACAN: Pátzcuaro, *King & Soderstrom* 5194 (MICH, NY, TEX, US); Zitácuaro, *Hinton* 13232 (GH, MICH, TEX, W), *Weber & Charette*



11884 (MICH). EDO. DE MEXICO: Temascaltepec, *Hinton* 1904 (NY), 2862 (NY, US), 3047 (US), 8396 (GH, US), 5148 (US); Nevado de Toluca, *Rose & Painter* 7911 (NY, US); "Volcán de Jorullo," *Humboldt & Bonpland* (P, type); Criadero de Trucha, *Matuda* 19398 (US); Amecameca-Popocatepetl road, *Beaman* 2128 (US). DISTRITO FEDERAL: Desierto de los Leones, [many collectors]; San Agustín, *Schaffner s.n.* (GH); La Venta, *Schiefer* 131 (GH); Santa Fe, *Bourgeau* 735 (US); "Ajusca Mountains," *Lemmon & wife* 78 (GH). MORELOS: ["Ayacapixtla et Tlaltenanco"], *Sessé & Mociño* 3974 (MA, type of *Polymnia odoratissima*; F). HIDALGO: Trinidad Iron Works, *Pringle* 13082 (F, GH, MICH). PUEBLA: Boca del Monte, *Arsène* 2140 (GH, US). VERACRUZ: Acultzingo, *A. J. Sharp* 44819 (NY); Jalapa, San Miguel, *Balls* 4725 (US); Mt. Orizaba, *Balls & Gourlay* 5280 (F, US), *Liebmann* 224 [8837] (US). GUERRERO: Mpio. Chichihualco, *Feddema* 2763 (MICH); Dist. Galeana, *Hinton* 14745 (GH, NY, US). OAXACA: Without locality ["mountains"], *Cuming* (GH), ["1750 m."], *Conzatti & González* 1001 (GH, US); Cerro de San Felipe, *Conzatti & González* 561 (F, GH), *C. L. Smith* 613 (TEX, US); Zimatlán, Sta. Inés del Monte, *Conzatti & Gonzalez* 1341 (GH); Mt. Zempoaltepetl, *Nelson* 572 (US); 35 miles south of Valle Nacional, *Cronquist* 9641 (MICH, NY, TEX, US). CHIAPAS: Mpio. de Chamula, *Breedlove* 6705 (F, MICH), *Breedlove & Raven* 13746 (MICH); Mpio. de Tenejapa, *Breedlove* 7004 (F, MICH), *Breedlove & Raven* 12951 (MICH); Mpio. de Zinacantán, *Breedlove* 7970 (F, MICH); Mt. Male, *Matuda* 4606 (F).

Selected specimens examined (Central America):

GUATEMALA: JALAPA: *Steyermark* 32653 (F), *Salas* 656 (US). QUICHE: *Heyde & Lux* [J. D. Sm. 3384] (F, GH, US). SOLOLA: *Williams et al.* 25407 (F). Also numerous collections from Departments of Chimaltenango, Huehuetenango, Quezaltenango, Sacatepéquez, San Marcos, Totonicapán.

COSTA RICA: Volcán Irazú (many collectors); Volcán de Turrialba, *Standley* 34936 (US); Cerro de Buena Vista, *Pittier* 3409 (GH, US); Laguna de Barba, *Pittier* 1903 (GH); El Copey, *Tonduz* 11910 (US); Prov. de San José, *Williams et al.* 24368 (F, US, W), *Standley* 42560 (US), *Standley & Valerio* 43528 (GH, US).

PANAMA: CHIRIQUI: Bajo Chorro, *Davidson* 150 (F, GH, US).